



Use of Unmanned Aerial Vehicles (UAVs) at ER Sites

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Objective



- Provide a brief overview of UASs
 - Requirements for commercial operation
 - Restrictions and considerations for operating
- Provide examples of UAS use at a project site

Unmanned Aircraft System



An unmanned aircraft system (UAS) is an aircraft without a human pilot onboard

- UAS is controlled remotely from an operator on the ground

Also referred to as Drones, Unmanned Aerial Vehicles (UAVs), or Remotely Piloted Aircraft (RPA)

- FAA uses UAS to refer to what we commonly see being used for commercial purposes and by recreational users/hobbyists

UASs can have a variety of configurations and outfitted with a variety of cameras, sensors, and equipment

Flights can be manually controlled or preplanned (equipment will fly itself on pre-determined route/pattern)



Brief History of UASs



1898

Nikola Tesla premieres a small radio operated boat at a Madison Square Garden exhibition



1935

Queen Bee

Created in the UK, this drone was used by the military for moving target practice.



**2001–
Present
Predator**

Designed in the U.S. This drone is used for surveillance and targeted warfare.



**2003–
Present**

Commercial drones gain popularity in construction, real estate, search and rescue, ect.

1918

Kettering Bug

Designed to drop bombs on targets during WWI. The war ends before the Bug is used.



Photo by Greg Hume

1964-1969

The Lightning Bug was created for surveillance during the Cold War by the United States.



2013

Amazon CEO, Jeff Bazos, announces the company's drone delivery plan, opening the door for commercial drone use.



Increasing Popularity = Increased Oversight



UASs are widely used for a variety of recreational and commercial activities

- Registry requirement for drones required starting December 21, 2015
 - Over 1 million drones registered (as of January 2018)

Due to safety concerns and incidents, Federal Aviation Administration (FAA) had to create process to regulate UAS usage

- Non-commercial UASs could be flown under the Advisory Circular 91-57, Model Aircraft Operating Standards, published in 1981
 - FAA claimed commercial operation illegal
- FAA Modernization and Reform Act of 2012 set a deadline of September 30, 2015, for the agency to establish regulations to allow the use of commercial drones



Current Commercial Use of Drones



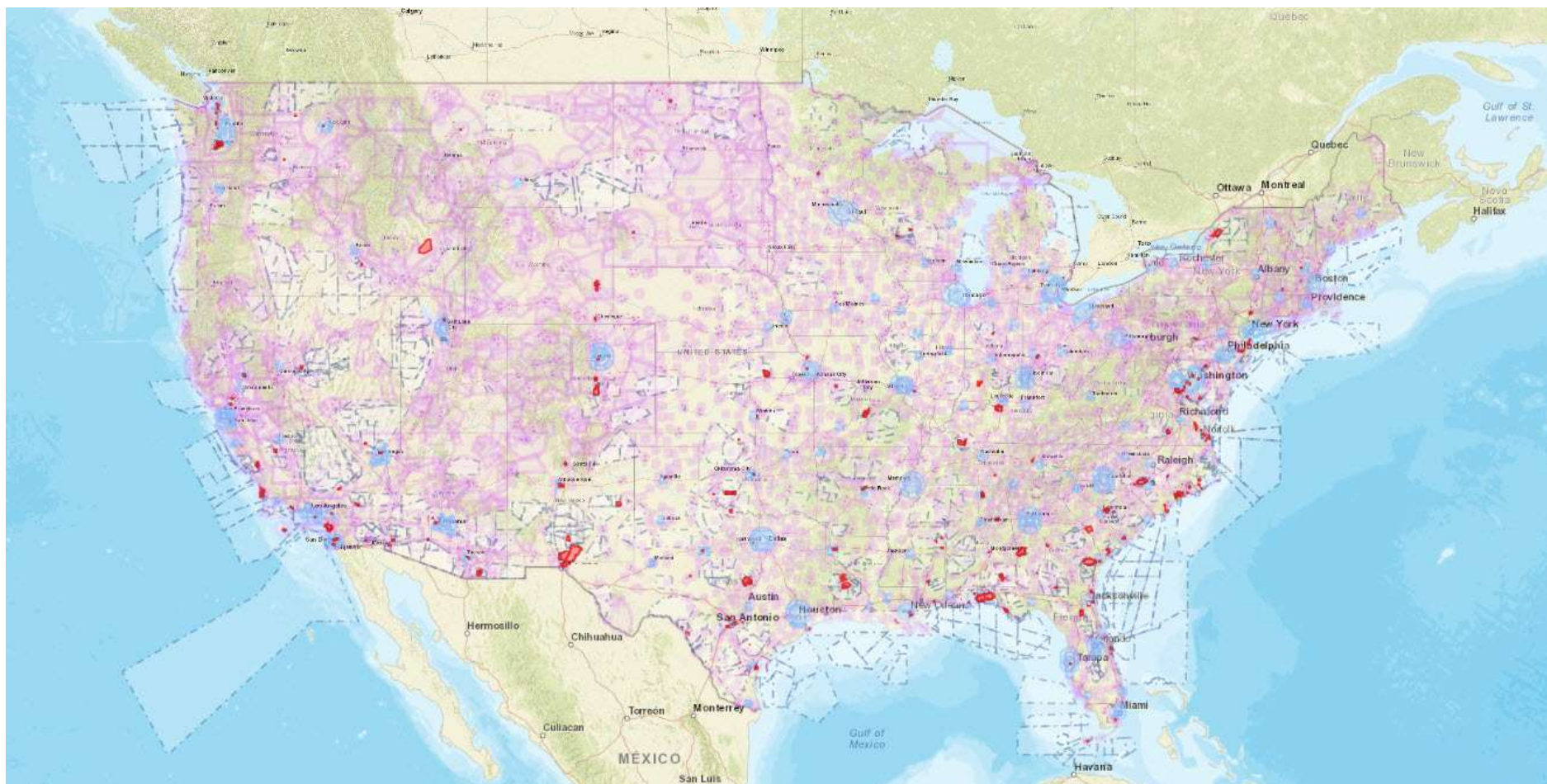
General requirements for commercial UAS use:

- UAS must be registered with FAA and marked
- Operator must have a Remote Pilot Certificate from the FAA
- UAS must be under 55 pounds
- UAS must fly within visual-line-of-sight*
- UAS cannot fly near other aircraft or over people*
- UAS cannot fly in controlled airspace near airports without FAA permission*
- UAS can only fly during daylight or civil twilight, at or below 400 feet*
- Maximum flight speed of 100 mph

* These rules are subject to waiver



Controlled Airspace in CONUS



Drones at Military Bases

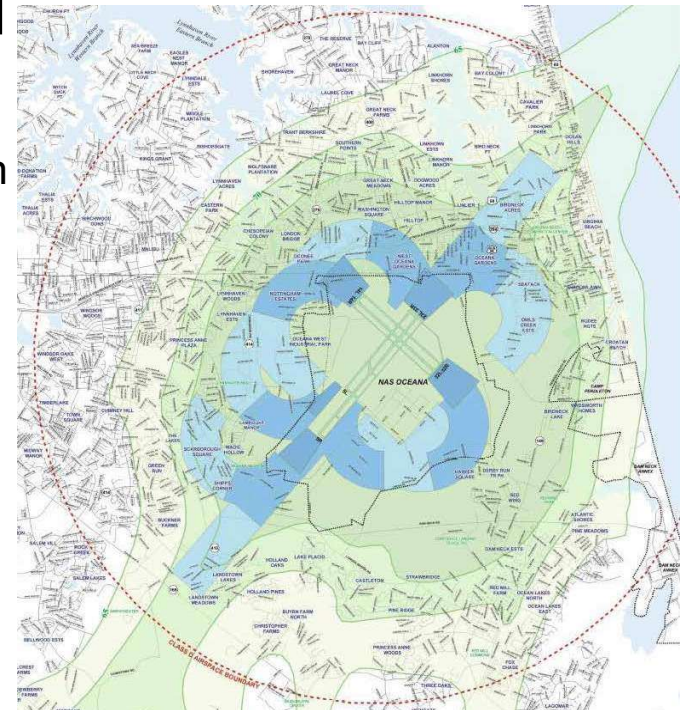


FAA is using its authority under 14 CFR § 99.7 – “Special Security Instructions” – to address national security concerns about unauthorized drone operations over 133 military facilities

- Designated “National Defense Airspace” in Notice to Airmen (NOTAM) 7/7282 issued on April 7, 2017.
- Violation of the NOTAM may be criminally charged in U.S. District Court and punished by fine and/or imprisonment

The FAA and the DoD have agreed to restrict drone flights up to 400 feet within the lateral boundaries of these 133 facilities.

- Only a few exceptions that permit drone flights within these restricted areas
- **Exceptions must be coordinated with the individual facility and/or the FAA**



NOTAM 7/7282



NOTAM : 7/7282

FDC 7/7282 FDC PART 1 OF 3 SECURITY..SPECIAL SECURITY INSTRUCTIONS FOR UNMANNED AIRCRAFT SYSTEM (UAS) OPERATIONS FOR MULTIPLE LOCATIONS NATIONWIDE APRIL 14, 2017 APRIL 13, 2019 LOCAL. THIS NOTAM REPLACES NOTAM 7/7137 DUE SOFTWARE COMPATIBILITY ERROR. PURSUANT TO 49 USC 40103(B)(3), THE FEDERAL AVIATION ADMINISTRATION (FAA) CLASSIFIES THE AIRSPACE DEFINED IN THIS NOTAM AS 'NATIONAL DEFENSE AIRSPACE'. OPERATORS WHO DO NOT COMPLY WITH THE FOLLOWING PROCEDURES MAY FACE THE FOLLOWING ENFORCEMENT ACTIONS: A) THE UNITED STATES GOVERNMENT MAY PURSUE CRIMINAL CHARGES, INCLUDING CHARGES UNDER 49 USC 46307. B) THE FAA MAY TAKE ADMINISTRATIVE ACTION, INCLUDING IMPOSING CIVIL PENALTIES AND THE REVOCATION OF FAA CERTIFICATES OR AUTHORIZATIONS TO OPERATE UNDER TITLE 49 USC 44709 AND 46301. PURSUANT TO 14 CFR 99.7, SPECIAL SECURITY INSTRUCTIONS (SSI), ALL UAS FLIGHT OPERATIONS, INCLUDING PUBLIC, CIVIL, AND MODEL AIRCRAFT, ARE PROHIBITED WITH THE AIRSPACE OVER SELECT NATIONAL SECURITY SENSITIVE FACILITIES, SFC-400FT AGL, EXCEPT AS PROVIDED FOR BELOW. THE LIST OF SELECTED FACILITIES, DEFINITIONS OF THE ASSOCIATED AIRSPACE IN WHICH UAS OPERATIONS ARE PROHIBITED, DESIGNATED FACILITY CONTACTS, AND OTHER IMPORTANT INFORMATION ARE PROVIDED AT THE 1704140000-1904132359 END PART 1 OF 3 FDC 7/7282 FDC PART 2 OF 3 SECURITY..SPECIAL SECURITY INSTRUCTIONS FOR UNMANNED FOLLOWING FAA WEBSITE: [HTTP://UAS.FAA.OPENDATA.ARCGIS.COM](http://UAS.FAA.OPENDATA.ARCGIS.COM). UAS OPERATIONS ARE AUTHORIZED WITH THE DEFINED SSI AIRSPACE IF IN COMPLIANCE WITH THE REQUIREMENTS LISTED BELOW: 1) THE UAS FLIGHT OPERATION HAS BEEN PRE-APPROVED BY THE DESIGNATED FACILITY CONTACT BASED ON CRITERIA ESTABLISHED BY THE SPONSORING FEDERAL AGENCY IN COORDINATION WITH THE FAA; OR 2) IF THE UAS FLIGHT OPERATION IS CONDUCTED IN DIRECT SUPPORT OF AN ACTIVE NATIONAL DEFENSE, HOMELAND SECURITY, LAW ENFORCEMENT, FIREFIGHTING, SEARCH AND RESCUE, OR DISASTER RESPONSE MISSION, AND PRIOR NOTIFICATION HAS BEEN PROVIDED TO THE DESIGNATED FACILITY CONTACT; OR 3) IF THE UAS FLIGHT OPERATION IS CONDUCTED IN DIRECT SUPPORT OF A SIGNIFICANT AND URGENT GOVERNMENTAL INTEREST AND IS APPROVED BY THE FAAS SYSTEM OPERATIONS SUPPORT CENTER (SOSC) IN ADVANCE OF ENTERING THE DEFINED SSI AIRSPACE; AND 4) THE UAS FLIGHT OPERATION COMPLIES WITH ALL OTHER APPLICABLE FEDERAL AVIATION REGULATIONS. IF YOU HAVE GENERAL QUESTIONS REGARDING UAS OPERATIONS, PLEASE REFER 1704140000-1904132359 END PART 2 OF 3 FDC 7/7282 FDC PART 3 OF 3 SECURITY..SPECIAL SECURITY INSTRUCTIONS FOR UNMANNED TO WWW.FAA.GOV/UAS/CONTACT/; OR CONTACT THE FAA VIA EMAIL AT UASHELP@FAA.GOV OR PHONE AT (844) FLY-MY-UA. IF YOU HAVE QUESTIONS REGARDING THESE UAS SSI, PLEASE REFER TO THE FOLLOWING FAA WEBSITE: [HTTP://UAS.FAA.OPENDATA.ARCGIS.COM](http://UAS.FAA.OPENDATA.ARCGIS.COM); OR CONTACT THE FAAS SOSC AT (202)267-8276. 1704140000-1904132359 END PART 3 OF 3

Additional Complicating Factors



Security Sensitive Airspace Restrictions

Temporary Flight Restrictions

Restricted or Special Use Airspace

Stadiums and Sporting Events

Wildfires

Airports

Regional/Local Restrictions

Land Owner/Manager Restrictions

Visibility

Weather/Atmospheric Conditions

Operating Capacity of UAS



Example Uses on MR Sites



Helps achieve to cardinal rule of explosives safety

- Expose the minimum number of people to the minimum quantity of explosives for the minimum amount of time

Work Area Assessments/Site Reconnaissance

- Locating MEC on the ground/sediment surface
- Habitat assessments
- Monitoring for various site needs

Site Planning

- Estimating level of effort/cost for removal actions
- Develop models and volumetric estimates based on aerial photographs

Should have plan and personnel in place to recover UAS if it crashes

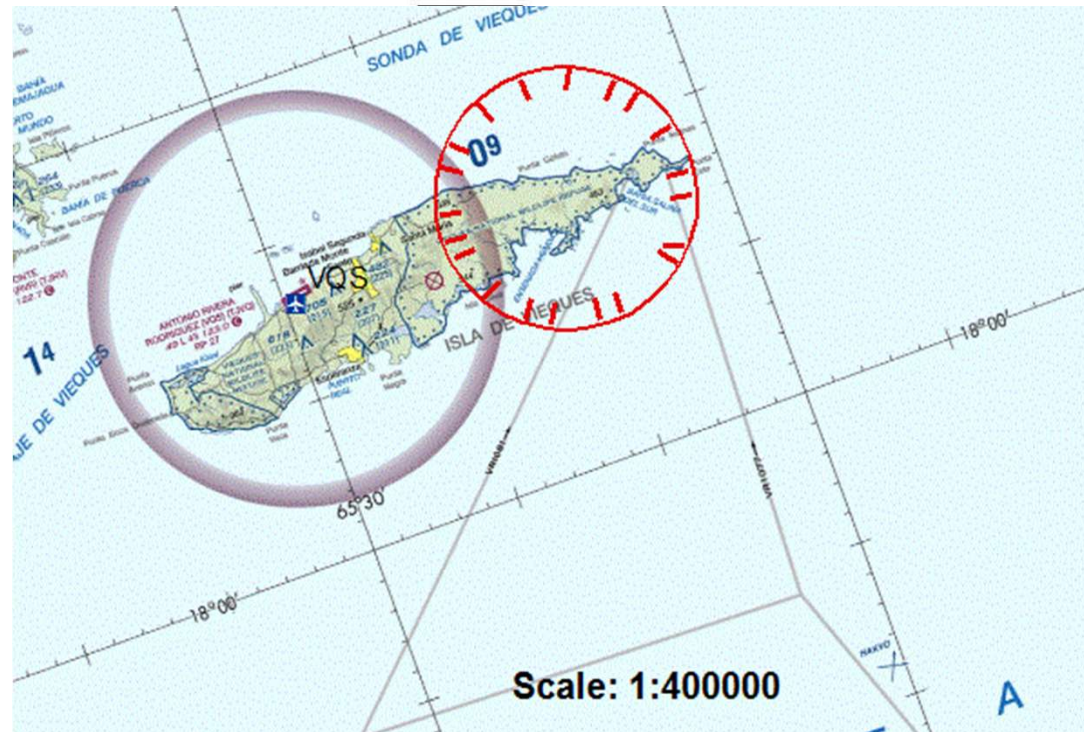


NOTAM for Vieques Project

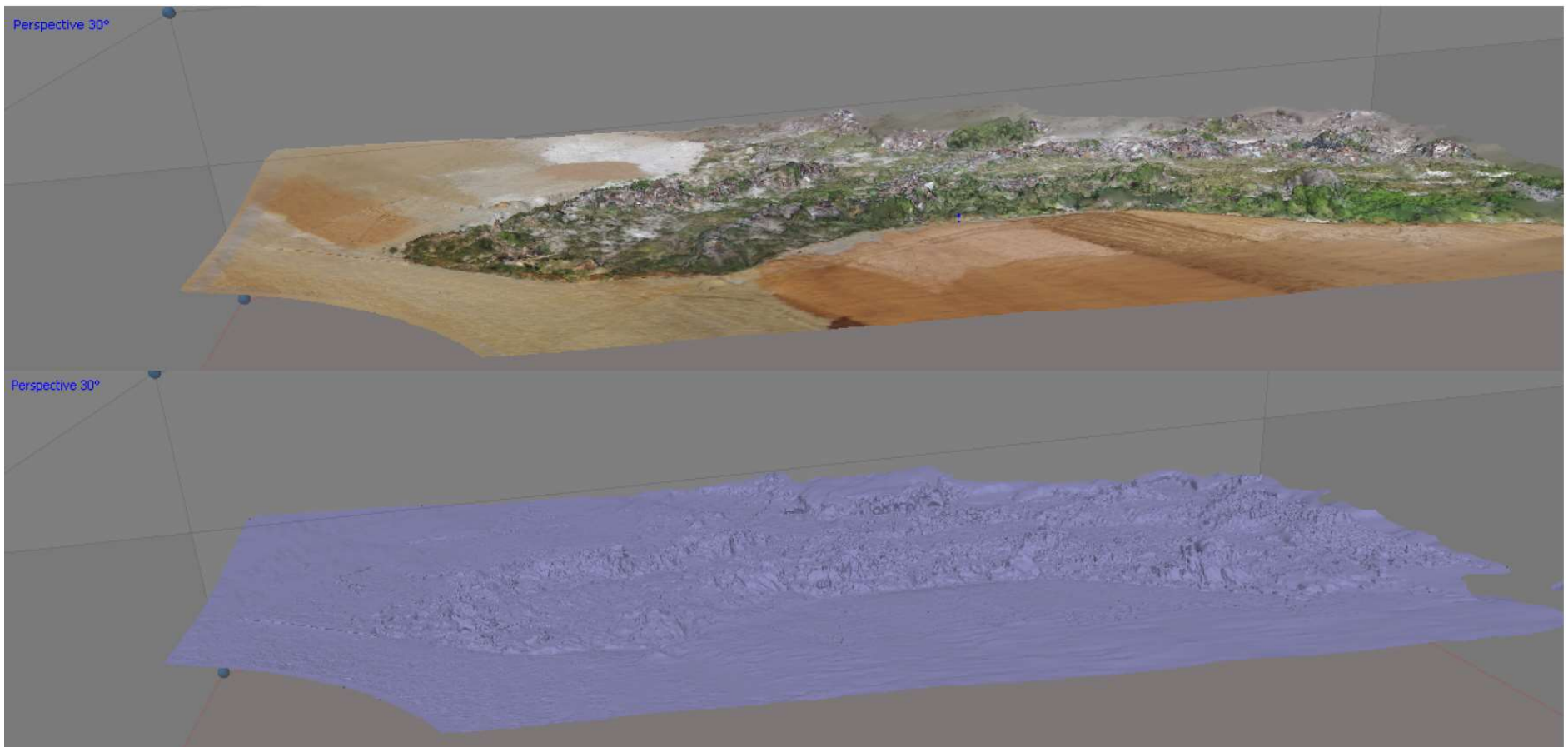


NOTAM : 7/6443

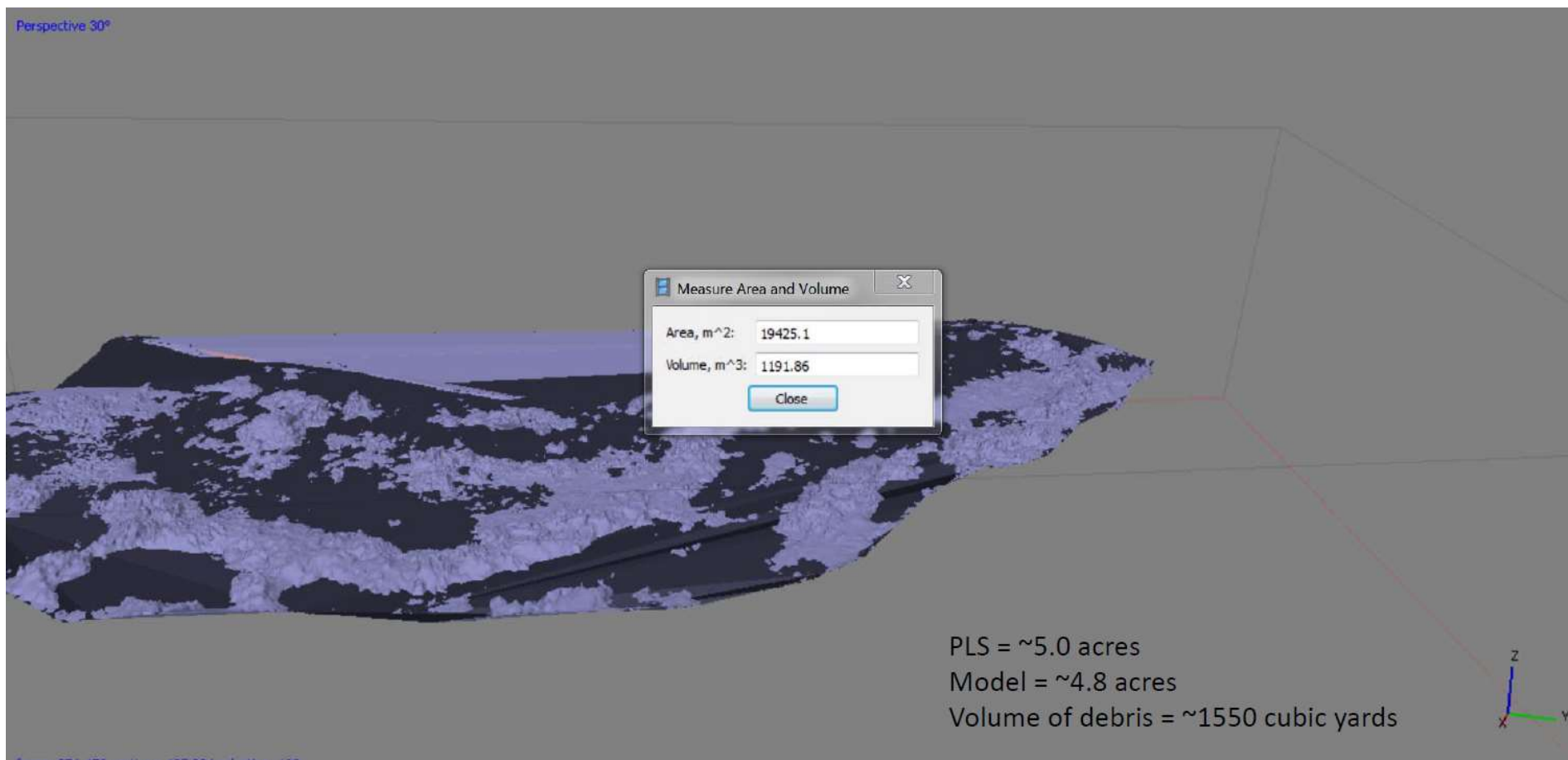
FDC 7/6443 ZSU PR..AIRSPACE VIEQUES, PUERTO RICO..TEMPORARY FLIGHT RESTRICTIONS WI AN AREA DEFINED AS 4.1NM RADIUS OF 180818N0652012W (STT244022.1) SFC-5000FT TO PROVIDE A SAFE ENVIRONMENT FOR ORDINANCE DISPOSAL OPERATIONS. PURSUANT TO 14 CFR SECTION 91.137(A)(2) TEMPORARY FLIGHT RESTRICTIONS ARE IN EFFECT. CH2M HILL, DENNIS BALLAM, TELEPHONE 757-672-8001, OR NAVFAC ATLANTIC, MADELINE RIVERA, TELEPHONE 757-286-6457, IS IN CHARGE OF THE OPERATION. SAN JUAN /ZSU/ CERAP, TELEPHONE 787-253-8664, IS THE FAA COORDINATION FACILITY. 1801081300-1812212200



3D Modeling



Volume Estimates



Vegetation Stress Monitoring



Knowledge Check



True/False – Anyone that has an UAS can fly at a project site, regardless of the location.

Which of the following are the current general requirements for commercial UAS use:

- a) UAS must be registered with FAA and marked
- b) Operator must have a Remote Pilot Certificate from the FAA
- c) UAS must fly within visual-line-of-sight
- d) UAS cannot fly near other aircraft or over people
- e) All of the above

True/False – Only the FAA has restrictions on UAS use.

Summary



Operating UASs for commercial purposes, in general, takes considerable planning and coordination

Flying UASs at/near military bases takes additional coordination with the FAA and the facility

Failure to comply with the rules can result in fines and jail time

Contacts and Questions



Points of Contact

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Questions ?

Supplemental Information



List Helpful Resources

- FAA website for UAS use:
<https://www.faa.gov/uas/>
- FAA GIS viewer for flight restrictions
<https://faa.maps.arcgis.com/apps/webappviewer/index.html?id=9c2e4406710048e19806ebf6a06754ad>
- Temporary Flight Restrictions (TFRs)
<http://tfr.faa.gov/tfr2/list.html>